

Drawings

The Examiner has objected to Figs. 5 and 6. The Applicants respectfully submit that Figs. 5 and 6 depict a conventional thin fan motor as described in Japanese Design Patent 1057608. In response to the Examiner's rejection, the Applicants have amended Figs. 5 and 6 with the legend CONVENTIONAL ART.

Also, Fig. 5 has been amended to correct the location of cross-section A, which corresponds with Fig. 6, and to remove reference character 25.

The drawings have been objected to as failing to comply with 37 C.F.R. § 1.84(p)(5). In the attached Substitute Specification, the specification has been amended to include reference to stopper 5, bearing cover 6, spacer 11, suction yoke 21, circuit board 22, thrust bearing 25, spacer 26, bearing 27, magnet yoke 29, shaft 33 and very thin fan motor with attached heat sink 100. Having responded to the Examiner's objection, the Applicants respectfully request that the objections to the drawings be withdrawn.

The drawings are further objected to by the Examiner because "reference number 13 in the specification does not correspond to a rotating shaft in the Figures." The Applicants respectfully submit that the Examiner has misinterpreted the specification with respect to shaft 13. Accordingly, and in order to clarify the specification, the Applicants have amended the specification at p. 7, line 15 as follows: "a rotor fan 10 unit in which a shaft 13 is supported and the rotor fan 10 is free to turn on ball bearings 7 in the center of the heat plate 14" The attached Substitute Specification reflects this change. Accordingly, the Applicants respectfully request that the Examiner withdraw the objection to the drawings.

The drawings are further objected to under 37 C.F.R. § 1.83(a). In response, the Applicants have amended Fig. 2 in an attached drawing correction to show a heat plate that matches the shape of an item to be cooled. With respect to a simple assembly process using pressure, bonding, welding or long screws, the Applicants have canceled this feature from claim 3. No new matter has been introduced by these changes. Having responded to the Examiner's objection, the Applicants respectfully request that the objection be withdrawn.

Specification

The Examiner has objected to the specification for informalities. In response, the Applicants have amended the specification in accordance with the Examiner's suggestions and in

order to correct minor matters of form. The changes to the specification are included in the attached Substitute Specification.

The Examiner has further objected to the specification as failing to provide proper antecedent basis for a stator coil substrate. The Applicants respectfully submit that the Examiner has not recognized that "a stator coil substrate" as recited in claim 1 of the present invention is supported by the specification at p. 5, line 19 (as originally filed). Accordingly, the objection to the specification should be withdrawn.

Claims 1-6 are Enabled

Claims 1-6 stand rejected under 35 U.S.C. § 112, first paragraph. The Examiner alleges that the specification does not have a full, clear, concise and exact written description of the rotor magnet's position around the periphery on the surface of the heat plate. The Applicants respectfully disagree with the Examiner. The Applicants further invite the Examiner's attention to the detailed description of the invention, p. 7, lines 11-26 (as originally filed) of the specification where the specification recites a rotor fan 10 driven by rare earth magnets 8 and a magnet yoke 9 fixed to the outer periphery of the rotor where the rotor fan 10 is supported on the heat plate 14. It is respectfully submitted that the inventors, at the time the application was filed, had possession of the claimed invention. Furthermore, the Examiner's attention is directed to Fig. 3 which shows rare earth magnets 8 in relationship to the heat plate 14. It is further submitted that the specification is enabled in such a way that one with ordinary skill in the art would know how to make or use the invention based on the specification.

Claims 1-6, as Amended, are Definite

Claims 1-6 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. In response to the Examiner's rejection, the Applicants have amended the claims so that the claims positively recite the features of the present invention. With respect to claims 4-6, the Examiner has amended claims 4-6 such that the broad limitation of excellent thermal conductivity is not followed by a narrow range or limitation. Furthermore, claim 7 has been added to recite the feature which has been removed from claims 4-6. Although this amendment is made in response to a rejection under § 112, the amendment is merely clarifying in nature, and should not in any way affect the scope of protection afforded the claims for infringement.

purposes, particularly under the Doctrine of Equivalents. Having responded to the Examiner's rejection under § 112, the Applicants respectfully request that the rejection be withdrawn.

Claim 1 is Patentable over Wang in view of Saito;
The Examiner has Not Made a *Prima Facie* Case of Obviousness

Claim 1 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Wang, U.S. Patent No. 5,583,746 (Wang) in view of Saito, U.S. Patent No. 5,979,541 (Saito). The Applicants respectfully traverse the Examiner's rejection because the Examiner has not made a *prima facie* case of obviousness.

It should be noted that three criteria must be met to establish a *prima facie* case of obviousness. *M.P.E.P.* § 2143. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings to achieve the claimed invention. *Id.* Second, there must be a reasonable expectation of success. *In re Rhinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976). Third, the prior art must teach or suggest all the claim limitations. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

The Applicants respectfully contend that the Examiner has not set forth a *prima facie* case of obviousness. There is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify Wang or Saito or to combine reference teachings to achieve the claimed invention.

The Examiner concedes that Wang does not teach or disclose "the fan having a two step inverted saucer shape, a raised central portion of the heat plate, a stator coil substrate, and the rotor blades pushing air in the radial direction" (p. 6, Paper No. 6), and alleges that Saito teaches these features of the invention. The Examiner states in the rejection that the alleged combination of Wang and Saito would be to "improve the cooling effect of the fan and prevent extraction of the fan through the intake aperture" (p. 7, Paper No. 6); however, the Examiner gives no explanation or teaching from any of the references to indicate that one with ordinary skill in the art at the time of the invention would have had motivation to apply the specific teachings of Saito to the Wang device to achieve the structure recited in the independent claims of the present invention.

Even assuming motivation could be found, the Examiner has not given any indication that one with ordinary skill in the art at the time of the invention would have had a reasonable expectation of success when combining Wang and Saito.

Furthermore, the prior art does not teach or suggest all the elements of the claims, either explicitly or inherently. Neither Wang, nor Wang in view of Saito, teaches or discloses rotor fan blades each formed in a same gentle arc, and in the inner portion of an inner/outer two-step multi-blade form of the rotor fan, the blade being set at an angle to move air through openings in the direction of rotational thrust toward an air intake, and outward from a central section, the blade which is set at the angle pushing the air in the radially direction of rotation, which is toward the outer periphery of the rotor fan, and the outer step that reaches beyond a raised central portion of the heat plate reaching down toward the object being cooled, in such a way that the outer step of the arced blades of the rotor fan is near the stacked heat radiation fins, the fan with the two-step multi-blade form being shaped like an inverted saucer. This particular fan shape is claimed in independent claim 1 and described in the specification at p. 6, lines 17-27; p. 7, line 27 through p. 8, line 15; p. 11, lines 2-10; and p. 11, line 28 through p. 12, line 14 (as originally filed).

Furthermore, the present invention is characterized by the structure of coils of a stator unit molded of a polymer and located facing the magnets of the rotor unit. This structure is disclosed in claim 2, the specification and the drawings. Neither Wang nor Saito teach or disclose a structure similar to the present invention such as the shape of the fan and the above structure.

The Applicants further contend that even assuming, *arguendo*, that the combination of Wang and Saito is proper, there is a lack of suggestion as to why a skilled artisan would use the proposed modifications to achieve the unobvious advantages first recognized by the Applicants. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680 (Fed. Cir. 1990).

For the reasons stated above, the Examiner has not set forth a *prima facie* case of obviousness; therefore, the Applicants respectfully request that the Examiner withdraw the § 103 rejections.

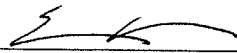
Allowable Subject Matter

The Examiner is thanked for indicating the allowability of claims 2, 3/2, 5 and 6/3/2.

Conclusion

Having responded to all rejections set forth in the outstanding non-final Office Action, it is submitted that the claims are now in condition for allowance. An early and favorable Notice of Allowance is respectfully solicited. In the event that the Examiner is of the opinion that a brief telephone or personal interview will facilitate allowance of one or more of the above claims, the Examiner is courteously requested to contact Applicants' undersigned representative.

Respectfully submitted,



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MARKED-UP VERSION OF THE AMENDED CLAIMS

1. (Amended) A very thin fan motor with heat sink attached which is a fan motor mounted in various kinds of electronic equipment that need to radiate heat, for the purpose of using air for a cooling effect;

characterized by having a fan motor mechanism that comprises a heat plate that supports a rotor fan that can rotate in a central position and that has a contact surface that matches the shape of the external surface of [the] an [item] object to be cooled, rotor magnets that are part of the rotor fan and are positioned around [the] a periphery of the rotor fan on the surface of the heat plate, and a stator coil substrate;

by having blades of the rotor fan each formed in [the] a same gentle arc, and in the inner portion of [the] an inner/outer two-step multi-blade form of the rotor fan, the blade being set at an angle to move the air through [the] openings in the direction of rotational thrust toward [the] an air intake, and outward from [the] a central section, the blade which is set at the angle pushing the air in the radial direction of rotation, which is toward the outer periphery of the rotor fan, and the outer step that reaches beyond [the] a raised central portion of the heat plate reaching down toward the object being cooled, in such a way that the outer step of the [curved] arced blades of the rotor fan is near to [the] stacked heat radiation fins, the rotor fan with the two-step [multi-blade] multi-blade form being shaped like an inverted saucer;

by having multiple thin metal heat radiation fins with excellent thermal conductivity arranged in parallel at fixed intervals above the heat plate outside the rotor fan as cooling heat-radiation fins;

and by combining the function of cooling heat sink with the heat radiation fins that conduct the heat absorbed from the heat plate and radiate it away by the action of the air moved by the rotor fan.

2. (Amended) A very thin fan motor with heat sink attached as described in claim 1 above, in which multiple heat radiation fins each having an opening large enough to accommodate with adequate turning room a rotor fan, are stacked on the heat plate, an air intake with a diameter smaller than the diameter of the rotor fan being placed over the center of the heat plate, and [the] coils of a stator unit that is molded of a polymer together with [the] a circuit

board around [the] a periphery of the air intake being located facing the heat plate, and the magnets of the rotor unit that includes the supported rotor fan being driven magnetically.

3. (Amended) A very thin fan motor with heat sink attached as described in claim 1 or 2 above, in which multiple heat radiation fins are stacked with a given interval between them and are connected by a heat conducting material or fittings, and in at least two diagonally opposed corners of the multiple heat radiation fins, [the] a heat sink unit and the stator unit are fixed together in a simple assembly process [using pressure, bonding, welding or long screws].

4. (Amended) A very thin fan motor with heat sink attached as described in claim 1, in which there is a heat plate formed of a material with excellent thermal conductivity[, such as a precious metal or copper] or a material that is partially diamond crystal, and the heat sink assembled on the heat plate is a stack of metal heat radiation fins made of copper or aluminum.

5. (Amended) A very thin fan motor with heat sink attached as described in claim 2, in which there is a heat plate formed of a material with excellent thermal conductivity[, such as a precious metal or copper] or a material that is partially diamond crystal, and the heat sink assembled on the heat plate is a stack of metal heat radiation fins made of copper or aluminum.

6. (Amended) A very thin fan motor with heat sink attached as described in claim 3, in which there is a heat plate formed of a material with excellent thermal conductivity[, such as a precious metal or copper,] or a material that is partially diamond crystal, and the heat sink assembled on the heat plate is a stack of metal heat radiation fins made of copper or aluminum.